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Tobacco Surveillance Data for Population Modeling: Getting the Inputs Right

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Overview of key tobacco surveillance systems

- Adult
  - NHIS
  - BRFSS
  - TUS-CPS
- Youth
  - YTS
  - YRBS
  - MTF
- Youth and Adults
  - NSDUH

- Purpose
- Content
- Sampling
- Sample Size
- Mode

All are repeated cross-sectional surveys and analyzed as such for trends

National Health Interview Survey (CDC)

- Purpose: Multi-topic annual health survey for US population
  - Cigarette Qs since 1965
- Content: Cigarettes annually, OTP periodically
  - Detailed questions on tobacco use in CC Supplement ~ every 5 years since 1987 (1987, 1992, 2000, 2005, 2010)
- Sampling: Multistage area probability sample of households and non-institutional group quarters (e.g., college dormitories)
  - Non-Hispanic Black, Hispanics, and Asians are oversampled
- Sample size: ~ 30-35,000 adults
- Mode: Computer-assisted personal interviewing (CAPI)
  - although some cases are collected via telephone

Behavioral Risk Factor Surveillance System (CDC)

- Purpose: Multi-topic annual health risk behavior survey for state surveillance (all 50 states, DC, PR and VI)
- Content: Cigarettes annually (Core), other tobacco products in optional module or state added Qs
- Sampling: RDD sampling, now with cell phones since 2011
- Sample size: state samples vary (2,500 to 40,000), combined samples yielded ~400-475,000
- Mode: Computer-assisted telephone interviewing (CATI)

"Historically, BRFSS included a notable amount of tobacco content…. However, more recent surveys have contained only a few tobacco items…… Given the burden of tobacco-caused disease in the United States, the erosion of tobacco content in the BRFSS is problematic" Delnevo & Bauer 2009, Prev Med

Tobacco Use Supp - Current Population Survey (NCI)

- Purpose: Periodic tobacco specific survey (~every 3 years) as a supplement to CPS (US Census) since 1992
- Content: considerable tobacco content + labor/employment
- Sampling: area probability sample designed to yield state estimates (combine 3 months of data)
  - one-year prospective follow-up of a subset of respondents (e.g. 2002-03 & 2010-11 overlap samples).
- Sample Size: ~56,000 households surveyed/month
- Mode: CATI and CAPI - 2 out of 3 respondents complete the TUS-CPS by telephone and the rest in person

National Youth Risk Behavior Survey (CDC)

- Purpose: monitoring health risk behaviors among high school students, biennially, since 1991
  - includes national, state and local surveys
- Content: multi-topic, addresses six priority health risk behaviors, including tobacco use
- Sampling: 3 stage cluster sample design
- Sample Size: national survey ~ 15,000
- Mode: self-administered in a school setting

National Youth Tobacco Survey (CDC)

- Purpose: monitoring tobacco use behaviors among high school and middle school students, biennially, since 1999
  - includes national, state and local surveys
- Content: tobacco-specific; beliefs, attitudes, behaviors, and exposure to pro- and anti-tobacco influences
- Sampling: 3 stage cluster sample design
  - Sample Size: national survey ~ 25,000 grades 6-12
- Mode: self-administered in a school setting

Monitoring the Future (Institute for Social Research -UM)

- Purpose: Conducted since 1975, MTF studies changes in the beliefs, attitudes, and behavior of young people
  - Sub-sample of 12th graders followed yielding longitudinal data
- Content: Some tobacco and other substances (alcohol & drug)
- Sampling: multistage sampling design to obtain nationally representative samples of 8th, 10th, and 12th grade students from 48 contiguous states
- Sample Size: ~50,000 students annually
- Mode: Self administered school based

MTF has remained methodologically consistent over time, making it an excellent data source to examine trends over the past 30 years.

National Survey on Drug Use and Health (SAMHSA)

- Purpose: primary source of info on illicit drug, alcohol, and tobacco use in civilian, non-institutionalized pop aged 12+

- Content: tobacco, alcohol and other drugs
    - only survey described herein that collects brand name information not only for cigarettes, but for cigars and smokeless tobacco

- Sampling: 50 State design with an independent, multistage area probability sample for each State and DC

- Sample Size: ~ 70,000 individuals aged 12 and older
    - sample is equally distributed among three age groups: 12 to 17 years, 18 to 25 years, and 26 years or older

- Mode: Audio computer–assisted self–interviewing (ACASI)

Setting, Mode, and Context:
why important?

- Methodological differences can affect the point estimate of tobacco prevalence

- If these factors remain stable over the years within surveillance systems, the effect on trends over time should be minimal

- Understanding differences helps us interpret data comparison across systems

Mode Effects

- Same questions asked in different modes can produce different responses
- Difficult to disentangle sampling, setting and mode effects
- Growing interest in mode effects because of mixed mode surveys
  - NHIS & TUS use two modes
- Not well studied for tobacco surveys, but body of survey research literature to draw on
- Differences observed may be related to
  - Social desirability
  - Primacy/Recency
  - Extremeness on scales
- Knowledge base is growing, many questions left unanswered

Mode Differences That Affect Respondent Answers

	Locus of Control is		Communication	
	Interviewer	Respondent	Aural	Visual
CATI	X		X	
CAPI	X		X	?
ACASI		X	X	X
PAPI (School)		X		X

Setting

- Setting for data collection (i.e., home vs. school) is one factor which may affect youth estimates
  - Relates to the extent of privacy allowed during data collection
- Household surveys tend to produce lower tobacco use estimates than school based surveys
- Mostly a "youth" survey issue
- No empirical studies evaluating this in adults, but reasonable to assume it could impact adult estimates as modes evolve, allowing adults to participate in non-household settings (e.g., cell phones, web-surveys (office/work environment)
  - may require some disentangling of setting vs. mode

Content: Single vs. multi-topics surveys

- Lower estimates of tobacco use behaviors on single topic tobacco surveys than multi-topic surveys

- In some cases, reported differences in smoking prevalence have been substantial, as much as 5 percentage points

- Research on this is limited (cigarettes); reasons for differences include

  – Tobacco-specific survey introduction- may cue potential participants into the topic and prompt current smokers to either deny tobacco use (Cowling et al., 2003) or refuse participation in the survey (RTI, 2006)

  – question context/ordering – e.g., some multi-topic surveys (e.g., YRBS, NSDUH) examine sensitive behavior –tobacco questions on the NYRBS are preceded by more sensitive topics (e.g., violence, illegal drug use)

Context Effect: Comparison of tobacco estimates from two surveys

2001-02 TUS

Have you ever used a pipe, **cigar**, chewing tobacco, or snuff even one time? (if YES)
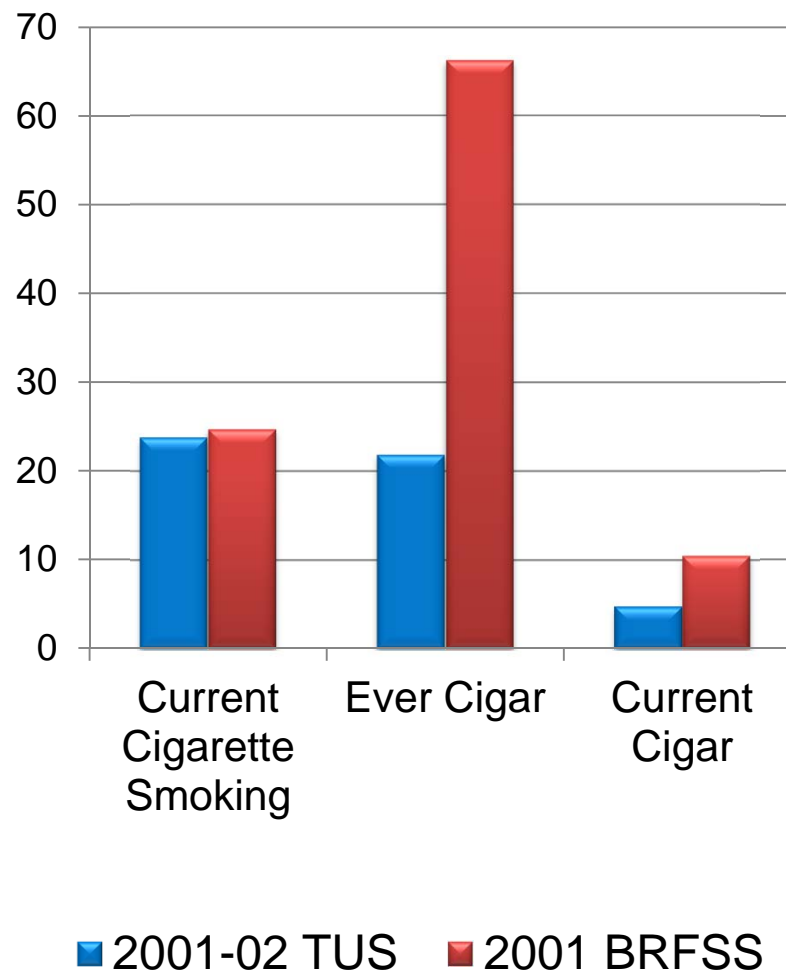   Which ones? (if CIGAR)

Do you NOW use cigars everyday, some days, or not at all?

2001 BRFSS Module on OTP

Have you EVER smoked a cigar, even one or two puffs?

Do you NOW smoke cigars every day, some days, or not at all?

Coverage of tobacco products across these systems

- Cigarettes
- Cigars
- SLT
- E-cigs
- Other products (e.g., hookah, pipe, RYO)

Measurement of non-cigarette tobacco products on major national surveys

C.D. Delnevo, U.E. Bauer / Preventive Medicine 48 (2009) S16–S23

Table 2
Inventory of tobacco host related measures across surveys

Topic	2007 NHIS	2005 NHIS CC Sup.	2007 BRFSS	2005 ATS C	2005 ATS M	2006 CPS-TUS	2007 NSDUH	NHANES	2005 HINTS	2007 MTF	2006 NYTS	2007 YRBS
Cigarette smoking behaviors												
Ever puffed/tried				X			X		X	X	X	X
100 Lifetime	X		X	X	X	X	X	X		X		
Now smoke every day or somedays	X		X	X	X	X	X	X		X	X	
Past 30 days	X			X		X	X			X	X	X
Age of first use	X				X	X	X	X		X	X	X
Number smoked per day	X			X		X	X	X	X	X	X	X
Quit attempts/history	X		X	X		X		X	X	X	X	X
Duration of abstinence/former smokers	X			X		X	X	X	X			
Cotinine								X				
Brand(s)				X			X	X		X	X	
UPC Code				X				X				
Regular/Light/Ultra-light				X		X	X				X	
Menthol		X		X	X	X	X				X	
Discount				X		X	X					
Use of other tobacco products												
Smokeless tobacco		X		X	X	X	X		X	X	X	X
Cigars		X		X	X	X	X			X	X	X
Pipes		X		X	X	X	X			X		
Bidis or Kreteks (clove cigarettes)		X				X	X			X	X	
Roll-your-own							X					

Largely confined to current use questions

Measurement of non-cigarette tobacco products on major national surveys *updated*

Use of other tobacco products	2013 NHIS	2013 BRFSS	2010-11 CPS-TUS	2012 NSDUH	2012 NYTS	2013 YRBS	2014 MTF
Smokeless tobacco	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cigars	???	No	Yes	Yes	Yes	Yes	Yes
Pipes	???	No	Yes	Yes	Yes	No	No
Bidis or Kreteks (clove cigarettes)	???	No	???	Yes	Yes	No	No
Roll-your-own	???	No	No	Yes	Yes	No	No
e-cigarettes	???	No	Yes	No	Yes	No	Yes

2013 NHIS- splits combusted /non-combusted

- These next questions are about your use of tobacco products OTHER THAN CIGARETTES. Tobacco products OTHER THAN CIGARETTES that are smoked include cigars, pipes, water pipes or hookahs, very small cigars that look like cigarettes, bidis, or cigarillos
  - * Do not include electronic cigarettes
- Do you NOW smoke tobacco products other than cigarettes every day, some days, rarely, or not at all?
- Do you NOW use smokeless tobacco products every day, some days, rarely, or not at all?

2014 NHIS- adds a question specifically on electronic cigarettes

Measures of Tobacco Use

- Measures of tobacco use differ slightly among surveys as well as target population
- Excellent resource *Surgeon General's Reports on Smoking and Tobacco Use*
  - Provides detailed operational definitions by survey

Measures - Ever Use and Initiation (cigarettes)

- Ever use/Ever smoked –
  - ever tried cigarette smoking, **even one or two puffs** (YRBS, YTS)
  - ever smoked **part or all** of a cigarette (NSDUH)
  - ever smoked at least 100 cigarettes in your entire life (NHIS*, BRFSS*, NSDUH)
- Initiation
  - How old when you smoked **whole cigarette for first time** (YRBS, YTS)
  - How old the **first time** you smoked **part or all** of a cigarette (NSDUH)
  - How old when you first started smoking cigarettes **every day** (NSDUH)
  - How old when you FIRST started to smoke **fairly regularly** (NHIS)

used as screener question, may miss some "late initiators"

Measures – Current Use (cigarettes)

- Current Use– Youth
  - Use in past 30 days (YTS, YRBS, NSDUH, MTF)

  Question wording varies for YTS/YRBS, NSDUH and MTF

- Current Use- Adults
  - ever smoked at least 100 cigarettes in your entire life and now smokes everyday or somedays (NHIS, BRFSS, TUS-CPS)

  Use of 100 cigs LT threshold
  - During the past 30 days on how many days did you smoke part or all of a cigarette (NSDUH)

  1 or more days= current / past 30 day smoker

used as screener question, may miss some "late initiators"

Measures – Former Smoker/Cessation (cigarettes)

- How long has it been since you last smoked a cigarette, even one or two puffs? (NHIS, BRFSS, TUS-CPS)
  - Only asked of those who smoked 100 cigs LT, but now smoking "not at all"

- How long has it been since you last smoked part or all of a cigarette? (NSDUH)
  - Asked of all who have ever tried smoking

What's in a name anyway?

- Tweaking of products for tax evasion purpose (cigars, RYO, pipe)
- Industry attempts to blur line between cigarettes and filtered cigars
- What do consumers understand?

Cognitive Testing of Cigar and SLT questions used on national surveillance systems (*2008)*

- Used to study the manner in which survey participants understand and respond to the survey with a special emphasis on potential breakdowns in this process
  - Test for comprehension, recall, response processes, and judgment
- Little filtered cigars were often thought of as cigarettes
- Cigarillos were thought of as (large) cigars
- Terms chew, dip, snuff were used interchangeably
- Little recognition for "snus"

Use of referent brands to aid in recall

- Used on YRBS/YTS for smokeless

*During the past 30 days, on how many days did you use chewing tobacco, snuff, or dip, such as **Redman, Levi Garrett, Beechnut**, Skoal, **Skoal Bandits**, or Copenhagen?*

Legend: ■ 12 to 17 ■ 18 to 25 ■ 26 +
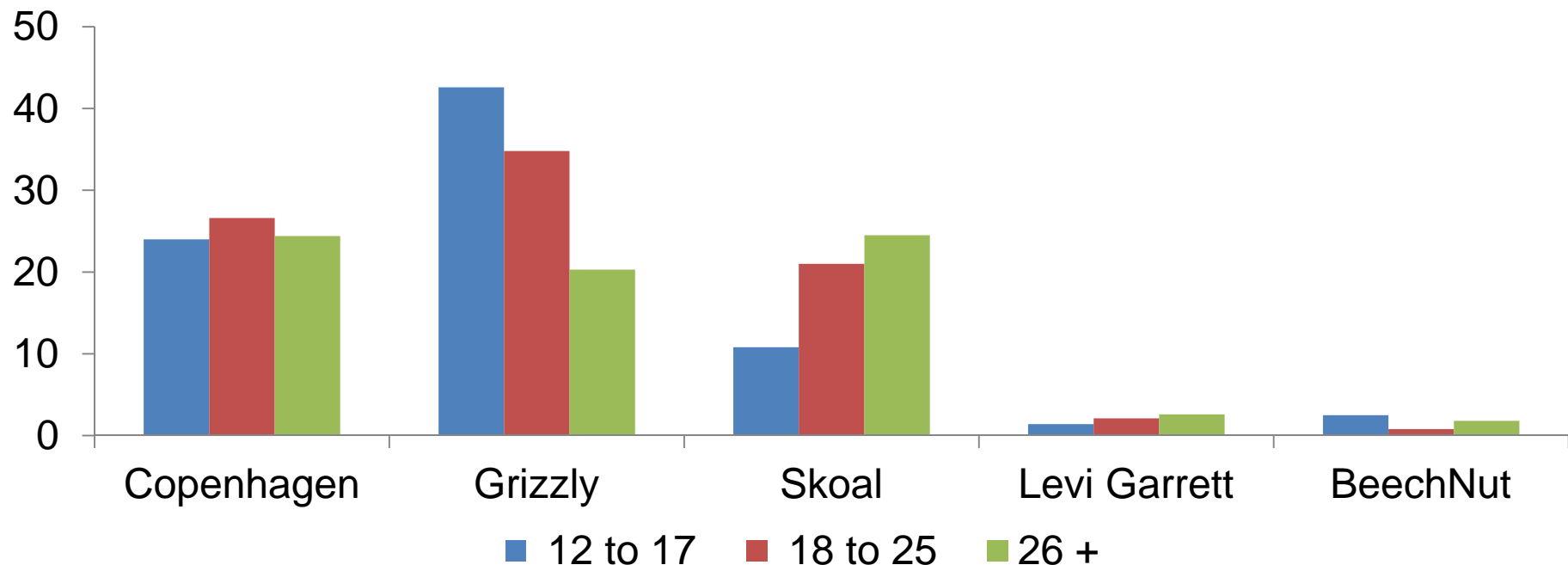
Use of referent brands to aid in recall

- Also being used for electronic cigarettes

- ***Which of the following tobacco products have you ever tried, even just one time? (YTS)***
  - Electronic Cigarettes or E-cigarettes, such as Ruyan or NJOY

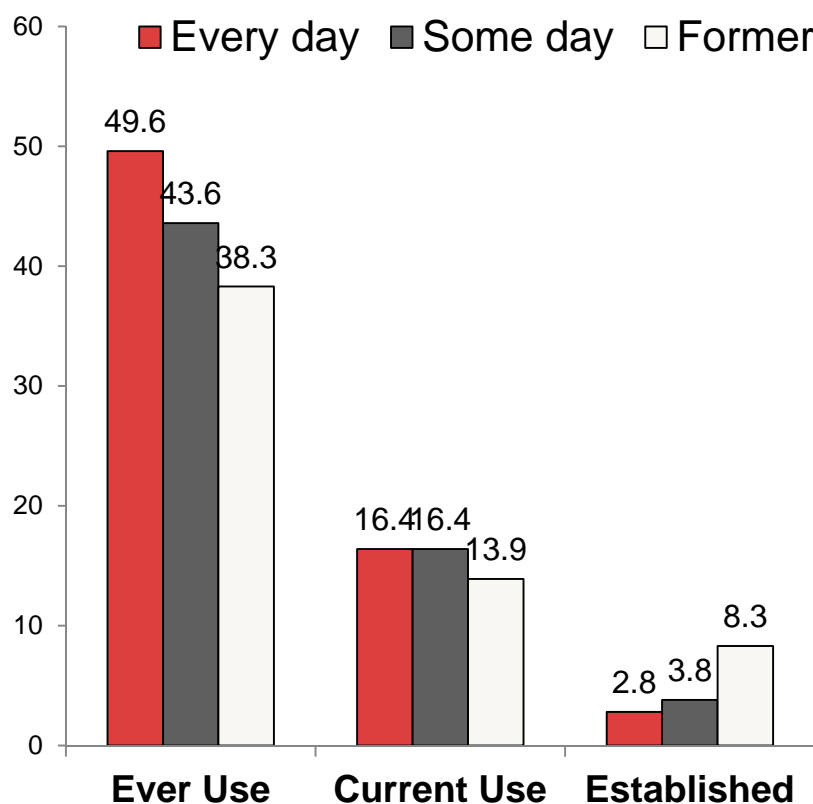 - *Doesn't match market data*

Black & Mild Cigars

"type of cigar" smoked among Black & Mild Users: 2010-2011 TUS

Large Cigar 24%

Little Cigar 49%

Cigarillo 27%

Cigar Descriptor on Packaging	*Weight*
Black & Mild Filter Cigar	2.4
Black & Mild Pipe Cigar	2.8
Black & Mild **Cigarillo**	3.3
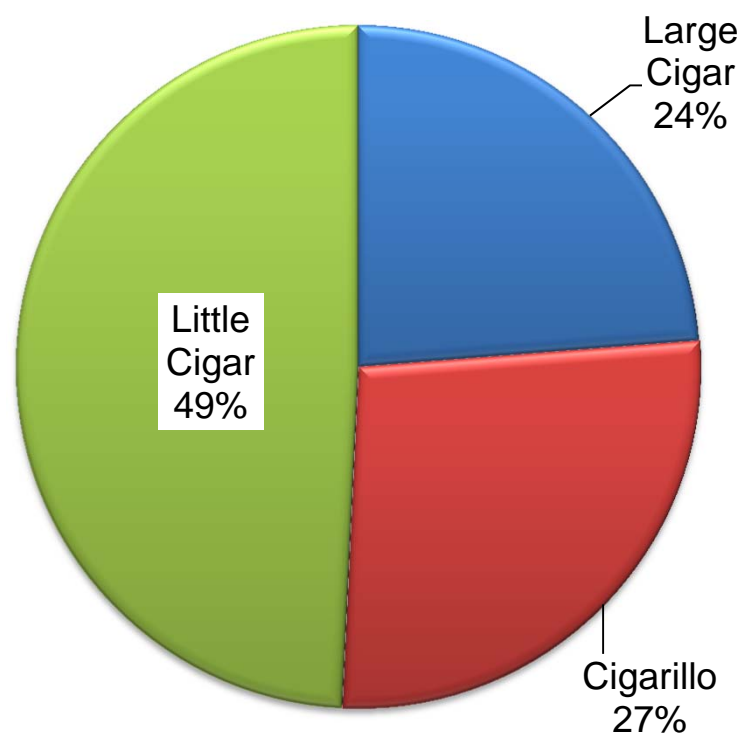
Use of threshold for emerging tobacco products: Patterns of e-cigarette use among cigarette smokers

- Experimentation very high among current smokers (and young adults)
- Established regular use overall is much less common, but is significantly more likely among former smokers

R21CA159160 & R21CA155956

Giovenco DP, Lewis MJ, Delnevo CD. Factors associated with e-cigarette use: A national population survey of current and former smokers. Am J Prev Med. 2014 (accepted, in press)

Major Gaps/Areas of Need

- Non-cigarette surveillance quality, depth and breath lag behind cigarettes

- Methods research needed

- Data on brands limited to cigarettes on most surveys, some data on non-cigarette tobacco product brands now for NHIS and TUS (*comprehensive brand data for all products on NSDUH for some time*)

- No data on sub-brand
  - ? Fast growing brand - Camel Crush – Camel menthol is gaining popularity among young people, is it due to Camel Crush?

- Flavored tobacco use
  - Survey questions lagging behind regulatory /policy need